

Hydrogen Integration Enabling Hydrogen Growth at Scale

Emmet Lagan Technical Director

laganenergyeng.com



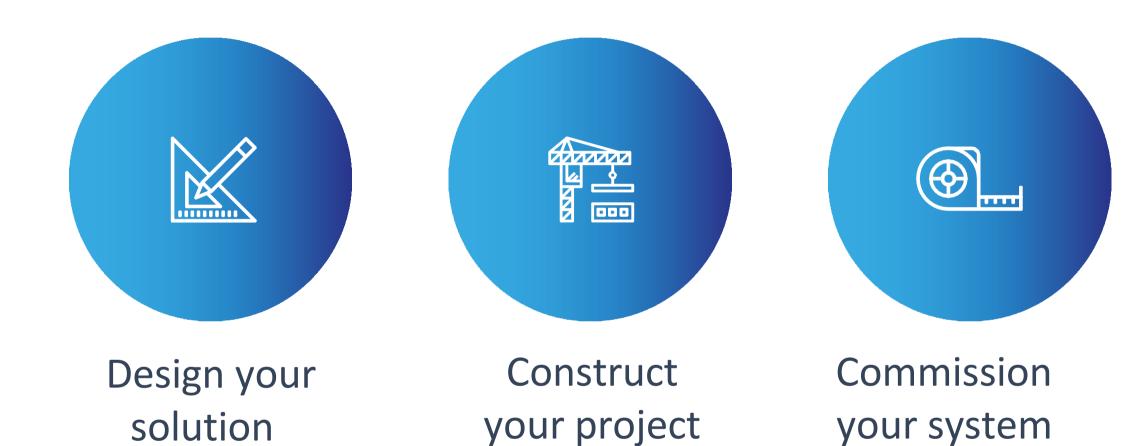
Your Partner in Energy and Beyond



HYDROGEN INTEGRATION – ENABLING HYDROGEN GROWTH AT SCALE

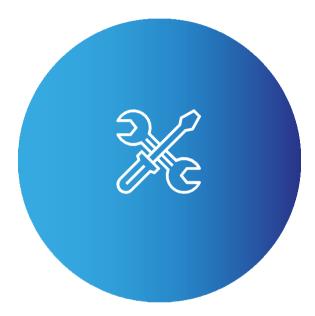


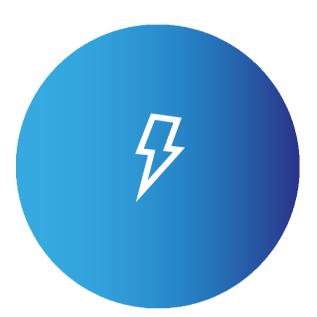
Our Service Offering



HYDROGEN INTEGRATION – ENABLING HYDROGEN GROWTH AT SCALE







Maintain your assets

Operate your system

Offering you an A-Z value proposition

Strategy

- Digital Tools
- Master Plans
- TCO* infrastructures & fleets
- Road maps
- Technical & Regulatory Consultancy

Pre-investment

- Due Diligence
- Pre-Feasibility & Feasibility Studies
- Conceptual Design
- Power System Development & Economics
- Environmental Impact Assessment & Licensing

Planning, Project Management & Operation, Sustainable Development, Risk Management & Safety Consulting

Decommissioning

- Dismantling
- Waste Management
- Soil Remediation
- Site Redevelopment

Operation

- Strategic O&M Engineering
- Simulators & Training
- Operation Support Solutions
- Modification, Renovation, Lifetime Extension
- Power System Operation & Control

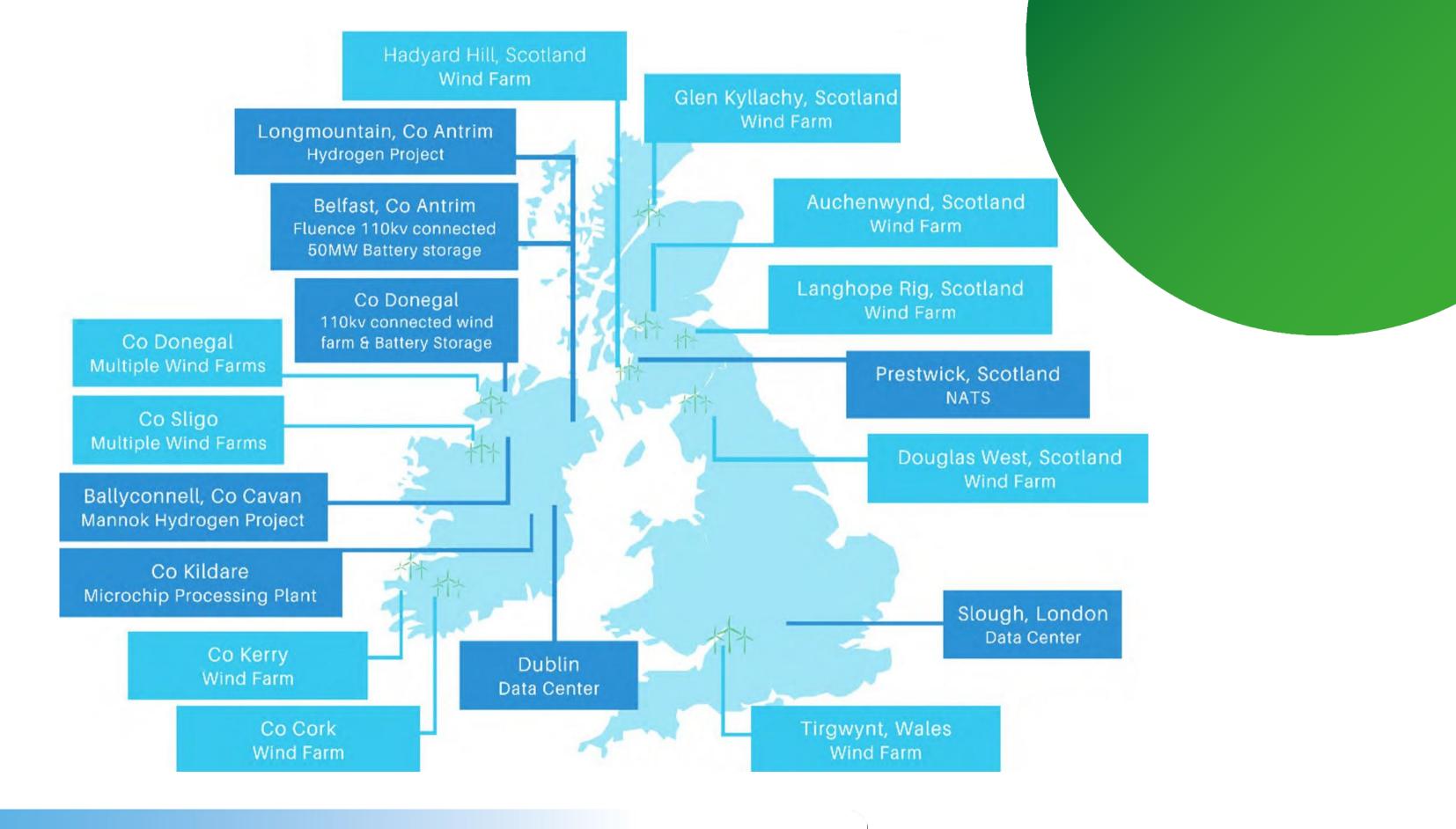
*TCO : Total Cost of Ownership



Implementation

- Support to permitting
- Front-End Engineering Design
- Basic & Detailed Design
- Complete tendering & bid comparison
- EPC / EPC-Management
- Owner's or Lender's Engineering
- HAZOP HAZID
- Quality Assurance & Quality Control
- Project & Contract Management
- Site Supervision & Commissioning

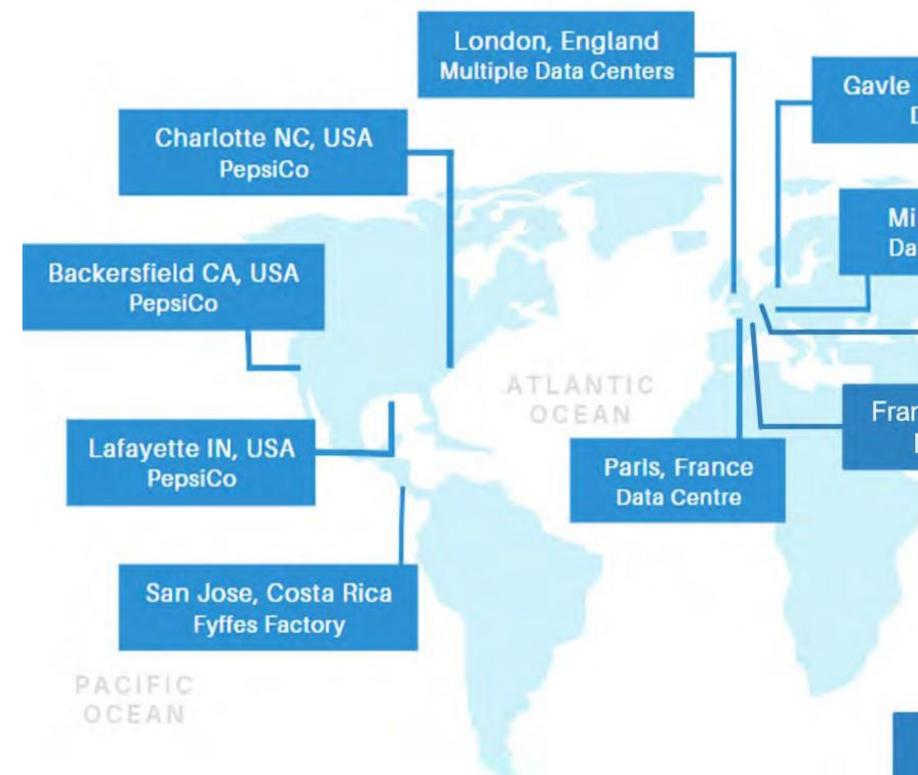
Ireland & UK Locations



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Global Locations



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Gavle & Lulea, Sweden Data Centers

> Milan, Italy Data Center

> > Amsterdam, Netherlands, Data Center

Frankfurt, Germany Data Center DCEAN

Brisbane, Australia Airport Link Project

OCEAN

Victoria , Australia Windfarm

Longmountain Hydrogen Project

Longmountain Wind Farm hydrogen project is a first of its kind in the UK and Ireland for green hydrogen production at large scale wind generation.

CLIENT	Energia Renewables	
LOCATION	Northern Ireland	
PERIOD	2019 – 2022	
CAPACITY	1 MW electroliser Design and Build	
SERVICES PROVIDED	Design and Build	
	 Principal Contractor for the design and build of the Civil and Electrical BOP including SCADA and GCC 	
	 Ensure grid code compliance once final install complete. 	
 Assist client with compiling employers' requirements 		
	 Participate in HAZZOP and HAZZID meetings to achieve full compliance for operational phase. 	
	 Execution of all electrical studies to include, harmonics, load flow, short circuit, 	
	 Maintain responsibility of CDM regulation on site. 	
	 Fully comprehensive handover file. 	
	 ATEX zone competent persons - Compex 	





Translink/Energia Hydrogen Refueling station

Translink have acquired circa 25 Hydrogen Busses. Lagan Energy were contracted to Design and Build the installation.

- CLIENT Energia Translink Milewater transport centre
- LOCATION Northern Ireland
- **PERIOD** 2019 2022
- **CAPACITY** Hydrogen Refueling Station Design and Build

SERVICES PROVIDED

Design and Build

- Principal Contractor for the design and build of the Civil and Electrical BOP including SCADA
- Complete the Lightening Protection design.
- Assist client with compiling employers' requirements for tender.
- Participate in HAZZOP and HAZZID meetings to achieve full compliance for operational phase.
- Execution of all electrical studies to include, harmonics, load flow, short circuit,
- Maintain responsibility of CDM regulation on site.
- Fully comprehensive handover file.
- Provide Engineering













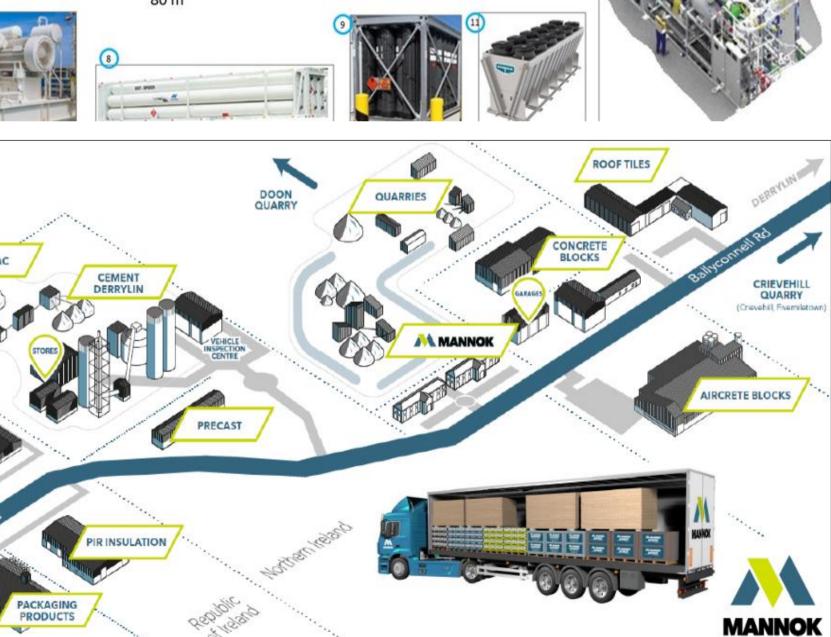


Considering TRACTEBEL Engineering TRACTEBEL Mannok Green Hydrogen Valley

Mannok intends to decarbonize its cement plants and quarry fleet with green H2 powered by electricity from existing wind farms

CLIENT	Mannok Holdings	•
LOCATION	Ireland-UK borders	6 0
PERIOD	2021 – 2022	
CAPACITY	Between 5MW and 50MW	
SERVICES PROVIDED	 Pre-Feasibility Study and FEED Study Assess potential location of H2 system Review H2 and O2 use in the cement industry Explore connection before or after the meter to qualify H2 as green-H2 Techno-economic analysis: mapping H2 demands vs wind production baseload & curtailment vs LCOH Techno-economic optimization of H2 production: electrolyser vs storage sizing vs LCOH Develop design basis Prepare conceptual design, layout, high-level description of key equipment, interface & tie-ins) Preliminary CAPEX & OPEX estimation 	SWANLINBAR QUARRY CEMENT BALLYCONNELL CEMENT BALLYCONNELL CEMENT

8 8 13 10' 10 17 12 16 6 9 60 m 常 (15) 80 m DOON QUARRIES TARMAC CEMENT DERRYLIN



Legend:

2

4

6

Transformer. Rectifier.

separation).

H2 LP buffer.

10. H2 HP compressor

15. H2 venting (dry flare).

16. Instrument air buffer.

Fire resistant walls without roof

17. H2 manifold

Closed building.

ZZ Road

Piperacks & Cable trays

Air cooler.
 Chiller.
 Dispenser.
 O2 venting.

H2 MP compressor.
 H2 MP storage (stacked by 2).
 H2 HP storage.

Electrolyser (including H2/water

Demin. water production skid.

Demineralized water buffer.

Hydrogen Unit

EPS INSULATION

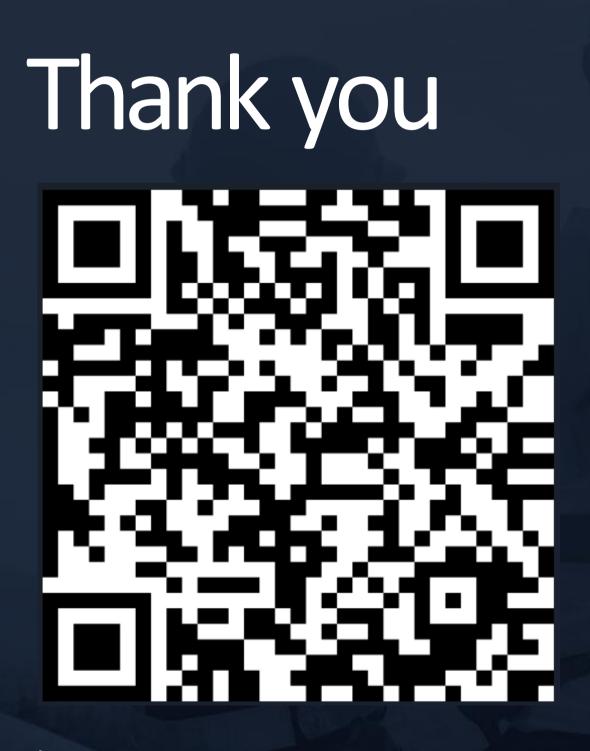


- Lender's approval Why?
- Dedicated Hydrogen Specialists in house
- Global Geographical Reach
- Partnerships with Global Leaders
- > We've sustained the growing pains, so you don't have to.









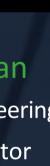


Stephen Lagan Lagan Energy Engineering **Operations Director**

tel. + 44 28 82839770 mob. +44 7881105352 Stephen.lagan@laganenergyeng.com

laganenergyeng.com

Contacts





Emmet Lagan Lagan Energy Engineering **Technical Director**

tel. + 44 28 82839770 mob. +44 7741251510 emmet.lagan@laganenergyeng.com